

AMENDMENTS TO THE CLAIMS

1. (original) A method of producing a video recording with improved dynamic range comprising:

providing a video camera comprising a video detector capable of converting an optical image into a sequence of video fields or frames, and an electronic shutter for adjusting the amount of light received by said detector from an optical image viewed by said camera;

operating said camera to capture an optical image;

commanding said electronic shutter to vary the amount of light received by said video detector from said captured optical image whereby to produce from said detector an output video signal constituting a sequence of video fields or frames representing the captured optical image, with said sequence comprising at least first and second fields or frames representing different exposure values of the captured image occurring repetitively in said sequence according to a predetermined repetition frequency;

processing said output video signal so as to produce a modified video signal consisting of a continuous sequence of said first fields or frames or a continuous sequence of said second fields or frames; and

selectively applying said modified video signal as an input signal to a video display apparatus whereby to cause said apparatus to display said captured optical image according to the first or second fields or frames contained in said modified video signal.

2. (original) A method according to claim 1 further including the step of recording said output video signal for use subsequently to drive a display means so that said captured optical image may be displayed according to the information contained in said first or second fields or frames.

3. (original) A method of producing a video recording with improved dynamic range comprising:

- providing a video camera comprising a video detector capable of converting an optical image into a sequence of video fields or frames, and an electronic shutter for adjusting the amount of light received by said detector from an optical image viewed by said camera;

- operating said camera to capture an optical image;

- commanding said electronic shutter to vary the amount of light received by said video detector from said captured optical image whereby to produce from said detector an output video signal constituting a sequence of video fields or frames representing the captured optical image, with said sequence comprising at least first and second fields or frames representing different exposure values of the captured image occurring repetitively in said sequence according to a predetermined repetition frequency;

- recording said output video signal in a recording medium;

- subsequently playing said output video signal out of said recording medium;

- processing said output video signal played out of said recording medium so as to produce a modified video signal consisting of a continuous sequence of said first fields or frames or a continuous sequence of said second fields or frames; and

- selectively applying said modified video signal as an input signal to a video display apparatus whereby to cause said apparatus to display said captured optical image according to the first or second fields or frames contained in said modified video signal.

4. (currently amended) A method of producing a video recording with improved dynamic range comprising:

providing a video sensor capable of converting an optical image into a video signal comprising a sequence of video fields or frames representing the optical image;

operating said video sensor to capture an optical image and simultaneously varying the amount of light received by said video sensor during the time frame of each video field or frame so that the resulting video signal representing said captured optical image will constitute a sequence of video fields or frames comprising ~~at least first and second~~ a series of first video fields or frames each representing substantially different a first exposure values value of the captured image occurring repetitively in said sequence and a series of second video fields or frames each representing a second exposure value of the captured image, with said first video fields or frames being interspersed among said second video fields or frames;

recording said resulting video signal in a recording medium;

deriving from said resulting video signal a modified video signal comprising a continuous sequence of only said first video fields or frames or a continuous sequence of only said second video fields or frames; and

applying said modified video signal to a display means whereby said captured optical image is displayed according to the video field or frame information contained in said modified video signal.

5. (currently amended) A method according to claim 4 wherein said modified video signal is derived from the video signal recorded in said recording medium ~~further including the step of recording said resulting video signal for use subsequently to drive a display means so that said captured optical image may be displayed according to the information contained in said first or second fields or frames.~~

6. (currently amended) A method according to claim 4 wherein said modified video signal is produced by processing said resulting video signal so

as to blank out said second video fields or frames and replacing said blanked-out second video fields or frames with said previously generated first video fields or frames.

7. (currently amended) A video camera system comprising:

a video camera for capturing an optical image and producing an output video signal that characterizes a continuous sequence of video fields or frames representing the captured optical image, said camera comprising a video detector means for generating said output video signal according to the light received from said optical image, and exposure control means for adjusting the amount of light received by said video detector from the optical image;

an exposure controller for said exposure control means so as to vary the amount of light on a video field or frame basis, whereby said output video signal characterizes an alternating sequence of at least first and second video fields or frames of which said first video fields or frames ~~having~~ representing the optical image captured with a first exposure value and said second video fields or frames ~~having~~ representing the optical image captured with a second substantially different exposures exposure value; and

means responsive to said output video signal for accomplishing one or more of the following actions: (a) producing a video display of the optical image according and in response to only said first video fields or frames; (b) producing a video display of the optical image according and in response to only said second video fields or frames; and (c) recording said output video signal for use subsequently to produce a video display of the optical image according and in response to said first video fields or frames or said second video fields or frames.

8. (currently amended) A video camera system according to claim 7 wherein said last-mentioned means comprises means for producing produces

a first video display according and in response to said first video fields or frames and a second concurrent display according and in response to said second video fields or frames.

9. (currently amended) A video camera recording system comprising:

a video camera for capturing an optical image and producing an output video signal that characterizes a continuous sequence of video fields or frames representing the captured image, said camera comprising a video detector means for generating said output video signal according to the light received from said image, and exposure control means for adjusting the amount of light received by said video detector from the optical image;

an electronic exposure controller for said exposure control means so as to vary the amount of light on a video field or frame basis, whereby said output video signal characterizes ~~an alternating~~ a continuous sequence of video fields or frames comprising at least first and second fields or frames of different exposures with said first fields or frames interspersed among said second fields or frames in a selected order;

recorder means for recording and playing back said output video signal;

signal processing means coupled to said recorder means for receiving said output video signal as it is read out of said recorder means and deriving therefrom a modified video signal comprising a sequence of only said first video fields or frames or only said second video fields or frames; and

means responsive to said modified video signal producing a video display in accordance with said sequence of first or second fields or frames.

10. (deleted)

11. (deleted)

12. (deleted)

13. (deleted)

14. (currently amended) A video camera system comprising:

means for producing a series of video signals representing a continuous sequence of video fields or frames of a selected optical image with at least certain of the video fields or frames comprising data representing a first exposure level and others of said fields or frames comprising ~~video~~ data representing a second greater or lesser exposure level, said certain video fields or frames being interspersed in said sequence among said other video fields or frames; and

circuit means for processing and utilizing said video signals to provide a flicker free video display of said selected optical image according to said first or second exposure levels only.

15. (deleted)

16. (currently amended) A video camera system according to claim 14 wherein said ~~last mentioned~~ circuit means comprises (a) a multiplexer for blanking said certain fields or frames that comprise data representing said first exposure level and replacing said blanked fields or frames with fields or frames comprising data representing said second exposure level, whereby to produce a modified video signal; ~~and further comprising~~ and (b) means for applying said modified video signal to a video display means to provide a flicker free video display of said optical image according to the data representing said second exposure level.

17. (original) A method for capturing and displaying video images comprising:

using a video camera to generate a video signal output that defines a continuous sequence of video fields or frames representing a captured optical image, with at least first and second fields or frames representing the image

captured with first and second different exposure times respectively, and said first and second fields and frames being produced in a consistent repetitive sequence with said first video fields or frames being interspersed in said continuous sequence among said second video fields or frames;

processing said video signal output to provide (1) a first modified video signal that defines a continuous sequence of said first fields or frames, and (2) a second modified video signal that defines a continuous sequence of said second fields or frames; and

utilizing said first and second modified video signals to produce separate displays of said captured optical image according to the exposures represented respectively by said by said first and second fields or frames.

18. (currently amended) A method of producing a video recording with improved dynamic range comprising:

providing a video sensor capable of converting an optical image into a video signal comprising a sequence of video ~~fields or~~ frames representing the optical image;

operating said video sensor to capture an optical image and simultaneously varying the amount of light received by said video sensor during the time frame of each video ~~field or~~ frame so that the resulting video signal representing said captured optical image will constitute a sequence of video ~~fields or~~ frames comprising at least a plurality of first ~~fields or~~ frames representing a first exposure value of the captured image and a plurality of second ~~fields or~~ frames representing a second exposure value of the captured image, with said first ~~fields or~~ frames being interspersed among said second ~~fields or~~ frames in said sequence;

deriving from said resulting video signal a modified video signal comprising a continuous sequence of said first ~~fields or~~ frames or a continuous sequence of said second ~~fields or~~ frames; and

applying said modified video signal to a display means whereby said captured optical image is displayed according to the video information contained in said modified video signal.

19. (currently amended) A method of recording and displaying video images comprising;

capturing a series of successive video images using different exposure times, with the exposure times varying according to a predetermined pattern so that first video images captured using a first exposure time are interspersed in said series with video images captured using a second and third different exposure times that differ from each other and also from said first exposure time;

producing a video signal representing said series of video images in the order that they are captured; and

using said video signal to generate a first video display of the video images captured using only one of said first, second and third exposure times.

20. (currently amended) A method according to claim 19 further including the step of using said video signal to generate a second video display of the video images captured using ~~only~~ another of said first, second and third exposure times.

21. (currently amended) A method according to claim 20 wherein said first and second displays are presented simultaneously ~~by a common display device~~.

22. (new) A video camera system comprising:

a video camera for capturing optical images and producing an output video signal that characterizes a continuous sequence of video fields or frames representing the captured optical images, said camera comprising a

video detector means for generating said output video signal according to the light received from said images, and exposure control means for adjusting the amount of light received by said video detector from the optical images;

a controller for controlling said exposure control means so as to vary the amount of light on a video field or frame basis, whereby said output video signal characterizes a continuous sequence of video fields or frames comprising at least first, second and third video fields or frames of different exposures, with said third video fields or frames interspersed among said first and second fields or frames;

signal processing means for deriving from said output video signal a modified video signal comprising a sequence of only said first, second or third video fields or frames; and

means responsive to said modified video signal for producing a video display in accordance with said sequence of first or second video fields or frames.

23. (new) A video system in accordance with claim 22 further including field code means for adding a first field code to each of said first video fields or frames, a second different field code to each of said second video fields or frames, and a third field code to each of said third video fields or frames, and further wherein said signal processing means utilizes said field codes to generate said modified video signal.

24. (new) A video camera recording system according to claim 9 further including means for adding a first field code to each first video field or frame and a second field code to each second field or frame characterized by said output video signal, and further wherein said signal processing means includes detector means for detecting said field codes and means responsive to said detector means for deriving said modified video signal from said output video signal on the basis of field codes detected by said detector means.

25. (new) A method for capturing and displaying video images comprising producing a continuous sequence of video signals representing a series of first and second video fields or frames representing images captured using relatively short and relatively long exposure times respectively, with said first video fields or frames being interspersed among said second video fields or frames, and using that sequence of video signals to generate a video display comprising (a) only the images captured using said relatively short exposure time or (b) only the images captured using said relatively long exposure time.

26. (new) A method for capturing and displaying video images comprising:
using a video sensor to generate a sequence of video signals comprising a series of first video fields or frames representing images captured by said video sensor during a first relatively short exposure time, a series of second video fields or frames representing images captured by said video sensor during a second relatively long exposure time, and a series of third video fields or frames representing images captured by said video sensor during a third exposure time shorter than said second exposure time but longer than said first exposure time, with said first, second and third video fields or frames being generated according to a predetermined pattern wherein said third video frames or field are interspersed among said first and second video fields or frames; and

using said sequence of video signals to generate a display of said images as represented by (a) only said first video fields or frames or (b) only said second video fields or frames or (c) only said third video fields or frames.

27. A method according to claim 26 wherein said sequence of video signals is used to generate two displays of said images, one display consisting of the images as represented by one of said series of said first, second and third video fields or frames and the other display consisting of the images as

represented by another of said series of first, second, and third video fields or frames.

28. (new) An image recording system comprising:

- a camera comprising an image sensing device for capturing optical images and producing an output video signal that characterizes a continuous sequence of fields or frames representing the captured images according to the light received from that image, and exposure control means for adjusting the amount of light received by said image sensing device from the optical image;

- an exposure controller for operating said exposure control means so as to vary the amount of light received by said image sensing device on a field or frame basis, whereby said output video signal characterizes a continuous sequence of first and second fields or frames with said first fields or frames having a first exposure value and said second fields or frames having a second exposure value and occurring alternately in time with said first fields or frames;

- recorder means for recording and playing back said output video signal;

- signal processing means for receiving said output video signal from said camera or from said recorder means and deriving from said output video signal a modified video signal comprising a sequence of only said first fields or frames or only said second fields or frames; and

- means responsive to said modified video signal for producing a video display of the captured images as represented by said sequence of first fields or frames or said sequence of second fields or frames.